# OPTO 22 SNAP PAC CONTROLLER & BRAIN COMPARISON CHART

**Form 1677-231218**

This table compares SNAP PAC controllers and brains using PAC firmware R10.0 and PAC Project R10.0 software (or higher). Shaded part numbers are obsolete as of 2022; **use rack-mounted controllers in place of SNAP PAC brains**.

| FEATURE | | SNAP PAC Controllers | | | | | | SNAP PAC Brains (Obsolete) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SW | Standalone | | Rack-mounted | | | Ethernet | | Serial | |
| | | SoftPAC | SNAP-PAC-S1 | SNAP-PAC-S2 | SNAP-PAC-R1<br>SNAP-PAC-R1-FM<br>(Obsolete) | SNAP-PAC-R1-B | SNAP-PAC-R2 | SNAP-PAC-EB1<br>SNAP-PAC-EB1-FM | SNAP-PAC-EB2<br>SNAP-PAC-EB2-FM | SNAP-PAC-SB1 | SNAP-PAC-SB2 |
| Runs PAC Control strategies | | ● | ● | ● | ● | ● | ● | | | | |
| Maximum PAC Control charts running at once (plus host task) | | 64 | 32 | 32 | 16 | 16 | 16 | | | | |
| Communication | Two independent Ethernet network interfaces (two IP addresses) | [a] | ● | ● | ● | ● | ● | | | | |
| | Two switched Ethernet network interfaces (one IP address) for multi-drop configuration | | | | | | | ● | ● | | |
| | Total number of RS-232 serial ports | [b] | 2 | 4[c] | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| | Total number of RS-485 serial ports | [b] | 1 | 4[c] | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Protocols | TCP/IP, UDP/IP | ● | ● | ● | ● | ● | ● | ● | ● | | |
| | EtherNet/IP™ (Allen-Bradley® RSLogix® systems and others) | | ● | ● | ● | ● | ● | ● | ● | | |
| | Modbus®/TCP (slave)[d] | | ● | ● | ● | ● | ● | ● | ● | | |
| | OPC driver support | ● | ● | ● | ● | ● | ● | ● | ● | ●[f] | ●[f] |
| | RESTful API | | ● | ● | ● | ● | ● | | | | |
| | HTTP/HTTPS | | ● | ● | ● | ● | ● | | | | |
| | OptoMMP memory-mapped protocol | ●[g] | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | SNMP (network management) | | ● | ● | ● | ● | ● | ● | ● | | |
| | FTP server, file system | | ● | ● | ● | ● | ● | ● | ● | | |
| | FTP client | ● | ● | ● | ● | ● | ● | | | | |
| | SMTP (email client with authentication and attachments) | ● | ● | ● | ● | ● | ● | | | | |
| SNAP-PAC nodes for Node-RED; RESTful API | | | ● | ● | ● | ● | ● | | | | |
| Direct access to hard drive & network drives (Dropbox®, etc.) | | ● | | | | | | | | | |
| Realtime clock | | [a] | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Backup battery (recharges when brain has power)[h] | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Physical RAM (MB)<br>RAM available for Strategy (MB)<br>Battery-backed RAM (MB)<br>Flash memory (MB) | | [a]<br>64<br>8<br>[i] | 32<br>16<br>8<br>16 | | 16<br>4<br>2<br>8 | | | 16<br>--<br>--<br>8 | | 16<br>--<br>--<br>8 | |
| Removable data storage (microSD card slot) | | [a] | 32 GB max.[k] | | 32 GB max.[k] | | | | | | |
| 32-bit processor | | [a] | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Floating-point unit (FPU) | | [a] | ● | ● | ● | ● | ● | | | | |
| Power requirements | | [a] | 8–32 VDC[l]<br>10 W–11.3 W max | | 5.0 to 5.2 VDC<br>@ 1.2–1.5 A | | | 5.0 to 5.2 VDC<br>@ 750 mA–1.0 A | | 5.0 to 5.2 VDC<br>@ 750 mA–1.0 A | |



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# OPTO 22 SNAP PAC CONTROLLER & BRAIN COMPARISON CHART

**Form 1677-231218**

| FEATURE | | SNAP PAC Controllers | | | | | | SNAP PAC Brains (Obsolete) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SW | Standalone | | Rack-mounted | | | Ethernet | | Serial | |
| | | SoftPAC | SNAP-PAC-S1 | SNAP-PAC-S2 | SNAP-PAC-R1<br>SNAP-PAC-R1-FM (Obsolete) | SNAP-PAC-R1-B | SNAP-PAC-R2 | SNAP-PAC-EB1<br>SNAP-PAC-EB1-FM | SNAP-PAC-EB2<br>SNAP-PAC-EB2-FM | SNAP-PAC-SB1 | SNAP-PAC-SB2 |
| Operating Temperature in degrees C<br>Storage Temperature in degrees C | | [a] | -20 to 60<br>-40 to 85 | | -20 to 60<br>-40 to 85 | | | -20 to 60<br>-40 to 85 | | -20 to 60<br>-40 to 85 | |
| Humidity (non-condensing) | | [a] | 0–95% | | 0–95% | | | 0–95% | | 0–95% | |
| Compatible I/O units[n] | SNAP PAC EB brains | ● | ● | ● | ● | ● | ● | | | | |
| | SNAP PAC SB brains | | ● | ● | | | | | | | |
| | SNAP PAC R-series controllers | ● | ● | ● | ● | ● | ● | | | | |
| | *groov* EPIC processors | ● | ● | ● | ● | ● | ● | | | | |
| | *groov* RIO modules | ● | ● | ● | ● | ● | ● | | | | |
| Combination controller and I/O processor | | | | | ● | ● | ● | | | | |
| Mounts on SNAP PAC I/O mounting rack | | n/a | n/a | | ● | | ● | ● | ● | ● | ● |
| Mounts on SNAP B-series I/O mounting rack | | n/a | n/a | | | ● | | | | | |
| Maximum number of modules allowed on largest rack:<br>Any mix of 16 digital, 16 analog, and 8 serial | | n/a | n/a | | ●[o] | ●[o] | ● | ● | ● | ●[p] | ●[p] |
| Digital I/O point features | Input latching | n/a | n/a | | ● | ● | ● | ● | ● | ● | ● |
| | On/off status | | | | ● | ● | ● | ● | ● | ● | ● |
| | Watchdog timer | | | | ● | ● | ● | ● | ● | ● | ● |
| | High-speed counting (up to 20 kHz)[q] | | | | ● | ● | | ● | | ● | |
| | Quadrature counting[r] | | | | ● | ● | | ● | | ● | |
| | On-pulse & off-pulse measurement[q] | | | | ● | ● | | ● | | ● | |
| | Frequency & Period measurement[q] | | | | ● | ● | | ● | | ● | |
| | TPO (time-proportional output) | | | | ● | ● | ● | ● | ● | ● | ● |
| | Digital totalizing[q] | | | | ● | ● | ● | ● | ● | ● | ● |
| | Pulse generation (continuous square wave, N pulses, on-pulse, off-pulse) | | | | ● | ● | ● | ● | ● | ● | ● |
| Analog I/O point features | Thermocouple linearization (32-bit floating point for linearized values) | n/a | n/a | | ● | ● | ● | ● | ● | ● | ● |
| | Minimum/maximum values | | | | ● | ● | ● | ● | ● | ● | ● |
| | Offset and gain | | | | ● | ● | ● | ● | ● | ● | ● |
| | Scaling | | | | ● | ● | ● | ● | ● | ● | ● |
| | TPO (Time-proportional output)[s] | | | | ● | ● | ● | ● | ● | ● | ● |
| | Output clamping | | | | ● | ● | ● | ● | ● | ● | ● |
| | Filter weight | | | | ● | ● | ● | ● | ● | ● | ● |
| | Watchdog timer | | | | ● | ● | ● | ● | ● | ● | ● |
| | Analog totalizing[t] | | | | ● | ● | ● | ● | ● | ● | ● |
| | Ramping[t] | | | | ● | ● | ● | ● | ● | ● | ● |



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| PID logic (maximum 96 PID loops per controller or brain) | | n/a | | ● | ● | ● | ● | ● | ● | ● |
| Data logging | | | | ● | ● | ● | ● | ● | ● | ● |
| Digital events, alarm events, serial events | | | | ● | ● | ● | ● | ● | ●u | ●u |
| Event messaging | | | | ● | ● | ● | ● | ● | | |
| UDP streaming of I/O data to host | | | | ● | ● | ● | ● | ● | | |
| I/O point data mirroring and memory map copying | | | | ● | ● | ● | ● | ● | | |

a As provided by the Microsoft Windows computer the software runs on.
b SoftPAC cannot communicate through serial ports on the PC.
c Serial ports are software configurable for RS-232 or RS-485.
d PAC firmware >=R9.4b, 8 max connections. Lower firmware, 2 max connections.
f Available with OptoOPCServer and PAC Control, through a SNAP PAC controller.
g SoftPAC includes Status Read, Status Write, and Scratch Pad memory map areas.
h Models manufactured before August 2007 and S1s with serial numbers 625653 and lower have user-replaceable backup batteries. See original user's guide.
i Flash memory function implemented via a file; size is limited only by disk space.
k PAC firmware 9.4a and loader 6.1a or higher. S-series with microSD & manufacture date older than 06/14 supports max. 2 GB microSD.
l Units with serial numbers lower than 500,000 have an 8–24 VDC input voltage rating. *Verify voltage on the unit's faceplate before applying power.*
n For compatibility with legacy Opto 22 hardware, see form #1693.
o SNAP-PAC-R1s with serial numbers lower than 600,000, and all SNAP-PAC-R1-Bs: limited to eight 4-point digital modules per rack.
p Not supported: serial, motion control, Profibus, & Wiegand modules.
q Four-channel modules only; not high-density modules.
r Requires a SNAP-IDC5Q quadrature input module.
s Requires a SNAP analog TPO module (SNAP-AOD-29).
t Requires a SNAP PAC controller and PAC Control commands.
u Does not support serial events.


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